

2-8 Continued

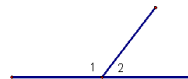
Theorem 2.3-The Supplement Theorem-If 2 angles form a linear pair, then they are supplementary.



Theorem 2.4-The Complement Theorem-If the non-common rays of two adjacent angles form a right angle, then they are complementary.

How they are used:

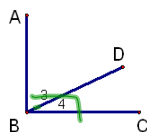
Given: picture



1. $\angle 1$ and $\angle 2$ are supplementary.

1. The Supplement Thm.

Given: $\overline{AB} \perp \overline{BC}$



1. $\angle ABC$ is a right angle

1. Def of \perp

2. $\angle 3$ and $\angle 4$ are complementary

2. The Complement Thm.

Theorem 2.6-Angles supplementary to same \angle or $\cong \angle$ s are \cong

Short-- Supplements of $\cong \angle$ s are \cong

G: $\angle 1 + \angle 2$ are suppl.
G: $\angle 3 + \angle 2$ are suppl.
C: $\angle 1 \cong \angle 3$

Theorem 2.7-Angles complementary to same \angle or $\cong \angle$ s are \cong

Short-- Complements of $\cong \angle$ s are \cong

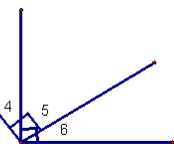
G: $\angle 4 + \angle 5$ are compl.
G: $\angle 6 + \angle 7$ are compl.
 $\angle 5 \cong \angle 7$
C: $\angle 4 \cong \angle 6$

Prove Theorem 2.7

Given:

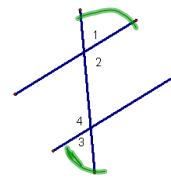
 $\angle 4 + \angle 5$ are compl.

Prove:

 $\angle 5 + \angle 6$ are compl.P: $\angle 4 \cong \angle 6$ 

| Statements | Reasons |
|--|------------------|
| ① $\angle 4 + \angle 5 = 90$ | ① Given |
| ② $m\angle 4 + m\angle 5 = 90$ $m\angle 5 + m\angle 6 = 90$ | ② def of Compl. |
| ③ $m\angle 4 + m\angle 5 = m\angle 5 + m\angle 6$ | ③ Subst. |
| ④ $m\angle 5 = m\angle 5$ | ④ Reflexive |
| ⑤ $m\angle 4 = m\angle 6$ | ⑤ Subtr. |
| ⑥ $\angle 4 \cong \angle 6$ | ⑥ Def of \cong |

How they are used:

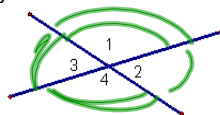
Given: $\angle 1 \cong \angle 3$ Prove: $\angle 2 \cong \angle 4$ 1. $\angle 1 \cong \angle 3$ 2. $\angle 1$ and $\angle 2$ are supplementary.
 $\angle 3$ and $\angle 4$ are supplementary3. $\angle 2 \cong \angle 4$ 

1. Given

2. The Supplement Thm.

3. Supplements of \cong \angle s are \cong

Theorem 2.8-Vertical Angles are congruent

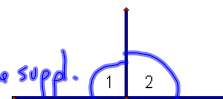
Theorem 2.9-- \perp lines form 4 right anglesTheorem 2.10-All right \angle s are \cong Theorem 2.11-- \perp lines form congruent, adjacent anglesTheorem 2.12-If 2 \angle s are \cong and supplementary, then each is a right angleTheorem 2.13-If 2 \cong \angle s form a linear pair, then each is a right angle.

Prove Theorem 2.12

Given:

 $\angle 1 \cong \angle 2$

Prove:

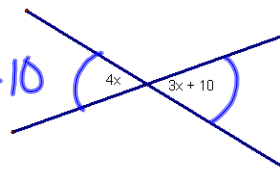
 $\angle 1 + \angle 2$ are supp.P: $\angle 1$ is a rt. \angle
 $\angle 2$ is a rt. \angle 

| S. | R. |
|--|-----------------------|
| ① ~ | ① Given |
| ② $m\angle 1 + m\angle 2 = 180$ | ② Def of suppl. |
| ③ $m\angle 1 + m\angle 1 = 180$ | ③ Subst. |
| ④ $2m\angle 1 = 180$ | ④ subst. |
| ⑤ $m\angle 1 = 90$ | ⑤ Div. |
| ⑥ $m\angle 2 = 90$ | ⑥ Subst. |
| ⑦ $\angle 1$ is a rt \angle $\angle 2$ is a rt \angle | ⑦ Def of rt. \angle |

Solve for x.

$$4x = 3x + 10$$

$$x = 10$$



$$18x - 30 + 3x = 180$$

$$21x = 210$$

$$x = 10$$

Given: $\angle 1$ and $\angle 2$ are supplementary**Conclusion:** $m\angle 1 + m\angle 2 = 180$ **Reason:** Definition of supplementary angles**Given:** $\angle 1$ and $\angle 2$ are complementary**Conclusion:** $m\angle 1 + m\angle 2 = 90$ **Reason:** Definition of complementary angles**Given:** $\angle 1$ is a right angle**Conclusion:** $m\angle 1 = 90$ **Reason:** Definition of right angles

Homework

p.112-113 #s 16-24, 27-32, 38